

Appendix D – Letter from Translab Corrosion Technology Branch

Memorandum

To: MARTY SKYRMAN
Geotechnical Design Branch-South
Section C

Date: May 15, 2001

File: 11-SD-905-KP
18.5/19.3
EA: 11-091801
Retaining Walls SV-1
and SV-2

From: DEPARTMENT OF TRANSPORTATION
DIVISION OF ENGINEERING SERVICES
MATERIALS ENGINEERING AND TESTING SERVICES - MS #5

Subject: Corrosion Review for Phase I 905 Expansion Project

We have completed our corrosion mitigation review of the Phase I 905 Expansion project outlined in an April 10, 2001 letter sent to Doug Parks of the Corrosion Technology Branch. Our review is based on a summary of corrosion test results of soil and water samples, and the Interim Caltrans Bridge Design Specifications 8.22 (July 2000) and Memo to Designers 10-5 (December 2000).

Project Description

The project site is located along Route 905 in San Diego County. There are two proposed structures (Wall SV-1 and SV-2) located at the site. The proposed structures are Type 1 retaining walls with spread footings.

Corrosion Review

Caltrans defines a corrosive area as an area where the soil and/or water contains more than 500 ppm of chlorides, more than 2000 ppm of sulfates, has a minimum resistivity of less than 1000 ohm-cm, or has a pH of 5.5 or less.

Eleven soil samples were taken at the site. The pH level of the soil ranged from 7.7 to 8.8. The minimum resistivity of the soil ranged from 333 to 1184 ohm-cm. The sulfate concentration of the soil ranged from 90 ppm to 1500 ppm and the chloride concentration of the soil ranged from 72 ppm to 780 ppm.

One water sample was taken at the site. The pH level of the groundwater was 9.1. The minimum resistivity of the groundwater was 1117 ohm-cm.

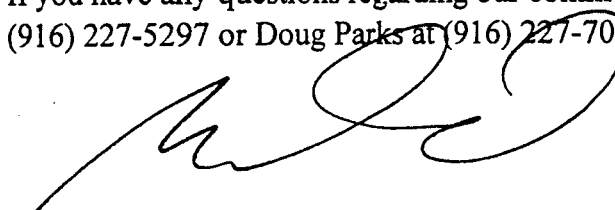
The soil on-site is corrosive based on low minimum resistivity levels and high chloride concentrations.

Corrosion Recommendations

In order to maintain a 75-year design life for the structures, we recommend the following corrosion mitigation measures:

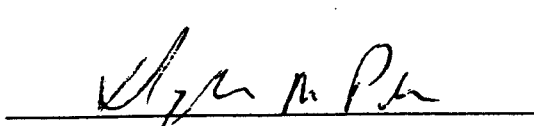
- The minimum concrete cover requirements for chloride environments are addressed in Table 8.22.1 of the BDS (July 2000) and Memo to Designers 10-5 (December 2000). Given chloride concentrations for soil at the site are between 500 ppm and 5000 ppm, a minimum concrete cover of 75 mm (3 inches) should be used for reinforcing steel in walls, and footings. Cementitious material shall consist of 25% by mass mineral admixture conforming to ASTM C618 Type F or N (flyash or natural pozzolans). Also, the water-to-cementitious material ratio shall not exceed 0.40. For additional information, please refer to SSP 90CORR_R12-20-00.

If you have any questions regarding our comments, please contact Michael Tolin at (916) 227-5297 or Doug Parks at (916) 227-7007.



MICHAEL TOLIN
Transportation Engineer (Civil)
Corrosion Technology Branch

Reviewed By:



DOUGLAS M. PARKS, Chief
Corrosion Technology Branch

c: Rob Reis, Corrosion Technology Branch
Arron Rambach, Corrosion Technology Branch
Susan Hall, Corrosion Technology Branch